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ABSTRACT

The receptiveness or preferences of children to certain types of gaming is addressed. This study used six different games with four different classes in grades 1 through 4. The teacher demonstrated how each of the games was played and each class was asked to rate which game they would like to play the most. All involved solving basic facts of the same level of difficulty. In addition, the third-grade students learned and played one additional game. The results were viewed to support the following: (1) Both girls and boys prefer games that are highly manipulative to those that are less so; (2) Students prefer games that are more competitive in nature; (3) Girls like to play highly feminine games; and (4) Children may enjoy simply working problems at the board just as much as playing some commercial games and time-consuming teacher-made ones. (MP)

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GAMES PEOPLE PLAY: GAME PREFERENCES OF STUDENTS
AS RELATED TO SEX DIFFERENCES AND OTHER FACTORS

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STATEMENT OF PROBLEM

Much has been written on the use of high interest materials and gaming to motivate children's learning of mathematics. Almost every major elementary math textbook has pages devoted to development of games; classrooms abound with teacher-made and commercial games; inservice for teachers frequently have sessions devoted to the use or development of high-interest materials; and educational retailers and corporations sell a host of these materials.

Indeed, it seems that it has become fashionable for teachers to have at least one corner of the classroom devoted to a "math center." These centers often contain some sort of math kit, game board, or a combination of both. It is impossible to say exactly how these materials are used, but it is probably safe to assume that they are often employed to reinforce skills, to simply provide activities for students who finish their work, or to occupy one group of students, freeing the teacher to work with another smaller group. However, the effectiveness of these materials probably depends on how the teacher uses them and how receptive or motivated students are to their use.

This paper will address the topic of children's receptiveness or preferences to certain types of gaming. It will further attempt to answer the following questions.

1. What are some types of games that children prefer to play?
2. Are game preferences related to sex differences?
3. Do children prefer games that are more highly competitive?
4. Do children prefer large group games to smaller group games?

RATIONAL FOR QUESTIONS OF STUDY

Can gaming increase student achievement?

In view of the fact that gaming has been widely accepted as a mode of instruction, this researcher feels it is worthwhile to at least question whether this kind of instruction is significantly superior to traditional forms of instruction or drill.

Schoedler (1981) determined the effectiveness of the active game medium compared with a conventional method of teaching mathematical concepts to second grade children. In this study two separate groups were taught fifteen lessons by each method and were given pre, post, and interval tests. Results indicate no significant differences between the two teaching methods. However, the enthusiasm exhibited by both teachers and students indicates that the active game medium should be considered as a positive alternative to the teaching of mathematics. This is supported by Madeline Hunter and other psychologists whose research indicates motivation increases in relation to positive feeling tone.

Devries (1976) reports cooperative classroom structures create more positive student attitudes and interpersonal relations. He reports TGT (Teams-Games-Tournament) is one cooperative-competitive classroom structure which facilitates learning mathematics and language arts. TGT was applied to third grade reading classes in this study. TGT students learned more vocabulary and verbal analogy skills than did a comparable control group. The study shows clearly that both cognitive and affective outcomes can be improved by changing the level of classroom cooperation-competition.

Is there a need for feminine high-interest materials?

A variety of publishers (Bomar, Troll, and Crest, to name a few) have an enormous amount of high-interest reading materials geared toward boys. Although materials exist that are highly appealing to both sexes, it appears that a large proportion is masculine in design such as racecars, sports, and monster books. This is understandable because of the large number of boys with reading problems. However, it seems that few, if any math materials exist that are specifically feminine in their construction.

Perhaps this is partly due to the fact that research is unclear as to whether or not mathematic achievement is disproportionate in males and females. Allen (1977) cites research

that compares scores of males and females on an objective-referenced mathematics test and on a norm-referenced test. The scores reflect the national pattern that girls compare favorably with or higher than boys in the elementary grades, but show lower achievement levels in the upper grades. One explanation of this is due to the decisions of many girls not to take advanced mathematics because they have a lower feeling of competency than males; many females feel math is a male activity; and many feel it is not likely to be of use in future career aspirations.

Sewald (1978) said research indicates that boys perform better on mathematical tests while girls perform better on reading tests. An investigation of why girls' and boys' performance differs was made by coding teacher interactions with second grade students during reading and mathematics instruction. Results reveal that teachers made relatively more academic contact with girls in reading and with boys in math; spent the same amount of time with boys and girls in both subjects; made more managerial contacts with boys in general; and while there are no differences in initial abilities, sex differences were found in end-of-year achievement.

Although it is not certain whether or not males' and females' math achievement is equal, there is evidence that sex-stereotyping of students exists, especially by teachers (Harding, 1980). Boswell (1979) reports that sex differences in attitudes are evident as early as third grade and that both sexes of elementary

school children consider mathematics a male subject. She concludes that (1) attitudes seem to affect students' mathematical achievement scores in elementary school; and (2) a large degree of stereotyping is associated with mathematics and this stereotyping begins very early during development.

Whether these attitudes are related to the environment, innate abilities, or both, is still debatable. However, it is probably safe to assume there are many girls with negative attitudes toward math as there are many boys with negative attitudes toward reading. Therefore it is probable that some girls may benefit through using high-interest feminine games.

METHODS

In this study four different classes, grades one through four, at Wooten Elementary, Austin, Tx., were shown six different games. The same teacher demonstrated how each of the games are played and each class was asked to rate which game they would like to play the most. All of the games involved solving basic facts of the same level of difficulty.

The first game, "Monster Craze," was a teacher-made game consisting of a game board with pictures of monsters. Students draw cards with addition facts and if they answer the problem correctly, they can move one space forward around the game board. Some spaces have words like "monster den, move back one space."

The first player to reach the end of the game board wins. The other games used are as follows.

"Orbit": This game was copied from a commercially made game called "Orbit the Earth." The teacher-made game has a game board with a picture of the earth in the middle. If they know the answer they can move to the planet orbiting the earth, containing that sum. The first one to completely orbit the earth is the winner. The game board consists of black poster board with pictures made from blue and yellow construction paper.

"Sneaky Snake": This game is similar to the above games except the game board is shaped like a huge blue and orange snake about four feet long. As students correctly solve addition facts, they may move one space forward until they reach the end of the snake's mouth.

"Bingo": This game was purchased commercially. Players spin a needle that lands on an addition fact. If the answer appears on a player's bingo answer sheet he can "x" it out. To win, a player must "x" five correct answers in a row.

"Hearts": This game board is in the shape of a very feminine little girl with red and pink hearts on her dress. Students are given equal amounts of red hearts with addition facts printed on them. Players take turns solving the facts. If they answer correctly they cover one of the hearts on the board with their paper heart. The first player to get rid of all their hearts wins the game.

"Go Fish": Players have fishing poles with magnets. They fish for paper fish that have math facts printed on them with the answers on the inside. Paper clips are attached to the fish so they will adhere to the magnets. If a player correctly solves the problem he gets to keep his fish. The player with the most fish wins.

Each student was given a sheet listing the six games. They were asked to put a one by the game they liked the best, a two by the game they liked second best and so on until all six were rated. Game preferences were tabulated according to which games received the most first place votes. Games were also ranked according to sex-preferences.

In addition, the researcher's third grade class played "Chalkboard Race." The class was divided into two teams and two sets of numbers, one for each team, was written on the chalkboard as follows.

$$\begin{array}{r} \text{add 6} \quad 2 \quad 7 \quad 5 \quad 1 \quad 9 \quad 4 \quad 8 \quad 3 \quad 0 \quad 6 \\ \hline 8 \quad 13 \quad 11 \quad 7 \quad 15 \quad 10 \quad 14 \quad 9 \quad 6 \quad 12 \end{array}$$

$$\begin{array}{r} \text{Add 6} \quad 8 \quad 3 \quad 0 \quad 6 \quad 2 \quad 7 \quad 5 \quad 1 \quad 4 \quad 9 \\ \hline 14 \quad 9 \quad 6 \quad 12 \quad 8 \quad 13 \quad 11 \quad 7 \quad 10 \quad 15 \end{array}$$

Individual teams came to the board. Having been given instructions such as "add six, add four," children wrote the answer below each number. The first one finished won a point for his team. After several days of playing "Chalkboard Race" and other games earlier discussed, the class was asked to rank which games it preferred

to play-"Chalkboard Race" or the "other ones."

FINDINGS

"Go Fish" received 29 first place votes; "Hearts" got 15; "Monster Craze"-15; "Orbit the Earth"-7. The number one favorite of both boys and girls was "Go Fish," indicating that the more manipulative the game, the better liked it is. "Hearts," the most feminine game, tied with "Monster Craze," coming in second. All 15 votes were from girls and "Hearts" was the solo second place winner among the primary grades. Fourth grade girls probably don't like it because it appears to be infantile. However, a more adult feminine game would probably be appealing to older girls.

RESULTS OF SURVEY

First Place Votes According To Grade Levels

	Monster Craze	Hearts	Go Fish	Bingo	Orbit	Sneaky Snake
First	1	2	12	0	0	2
Second	6	6	3	0	5	2
Third	4	5	6	4	2	2
Fourth	4	2	8	3	6	4

Total First Place Votes	First Place Votes in Primary
Go Fish-29	21
Hearts-15	13
Monster Craze-15	11
Orbit the Earth-13	7
Sneaky Snake-10	6
Bingo-7	4

Number of Males and Females by Grade Level

Males		Females
First	8	9
Second	13	9
Third	12	11
Fourth	12	11
TOTAL	45	40

In addition all of the third graders said they preferred to play "Chalkboard Race" over all of the other games. Their enthusiasm was subjectively noted. As the game was played a competitive air existed with students shouting and rooting for their teams.

This class was also asked if they thought the teacher-made game, "Orbit," was prettier than the purchased one. All students said they thought the teacher-made one was "better." The students did not know who made the game.

Also, third graders were asked if they preferred to play the small group games with the game boards or preferred working problems on the chalkboard. Surprisingly, 19 out of 23 said they would prefer to "go to the board and work problems."

CONCLUSIONS

Results of this study give support to the following.

1. Both girls and boys prefer games that are highly manipulative to those that are less manipulative.
2. Students prefer games that are more competitive in nature. In the case of "Chalkboard Race" and in working problems at the board, the students received immediate teacher reinforcement throughout the entire activity. Since the teacher must be present, perhaps this accounts for a great deal of the student motivation.
3. Girls like to play highly feminine games. This type of game may have instructional value with girls who have negative attitudes toward mathematics.

4. Children may enjoy simply working problems at the board just as much as playing some commercial games and time consuming teacher-made games.

In addition, teachers need to become critical evaluators of games and decide how much instructional time should be spent on their use. Highly independent games by their very nature take careful monitoring by the teacher. Further research is needed to determine if the positive attitudes associated with them is significant enough to merit large scale use. One must decide if the extra time needed for their employment and construction would best be spent in other forms of direct teaching.

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